Biology
Chemistry
Astronomy
Aviation Math & Physics
AP Biology
AP Chemistry
Environmental Science
AP Environmental Science
Food Chemistry
Geology
Human Anatomy & Physiology
Introduction to Organic Chemistry
Physics
AP Physics I
AP Physics C
Physical Science
Career Internship Program

Science

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Science Department Philosophy

All high school students need a broad background in science. To attain a broad background, all students should complete at least three years of science including one course each in biology, chemistry, and physics. If these three core courses are completed by the end of junior year, students have maximized their opportunities to do well on standardized tests, such as ACT and PSAE, and will be prepared for further study of science during their senior year.

An important component of all science courses is laboratory work. Laboratory work gives students direct contact with the material studied in the course, develops lab skills, increases a student's understanding of how science actually works, and helps the student develop analysis, interpretation, and synthesizing skills.

Science Sequences
There are many science sequences that students may select because of their interests and career plans. The sequences shown below are intended to provide a solid background in science and not restrict students in their choices. Other sequences are possible when students, with input from teachers, counselors and parents, choose different course levels for biology, chemistry, and/or physics.

General Information
- Two credits in science are required for graduation. However, courses in biology, chemistry, and physics should be included in every student's four year academic plan to provide a balanced preparation for future vocational and/or educational goals.
- Most colleges require at least two credits of a laboratory science for admission and some (especially Illinois universities) require three. Many colleges and universities suggest a three or four year sequence for students entering engineering, medicine and the health services, home economics, and computer sciences.
- Most colleges recommend both natural and physical science experience.

Science Placement into Academic Ability Levels
The Division Chair recommends placement for incoming freshmen based upon an integrated analysis of the following performance indicators:

1. standardized test scores on the EXPLORE test
2. information from the eighth grade teachers

Science and Advanced Placement (AP)
The Science Department offers preparation for AP examinations in four areas.

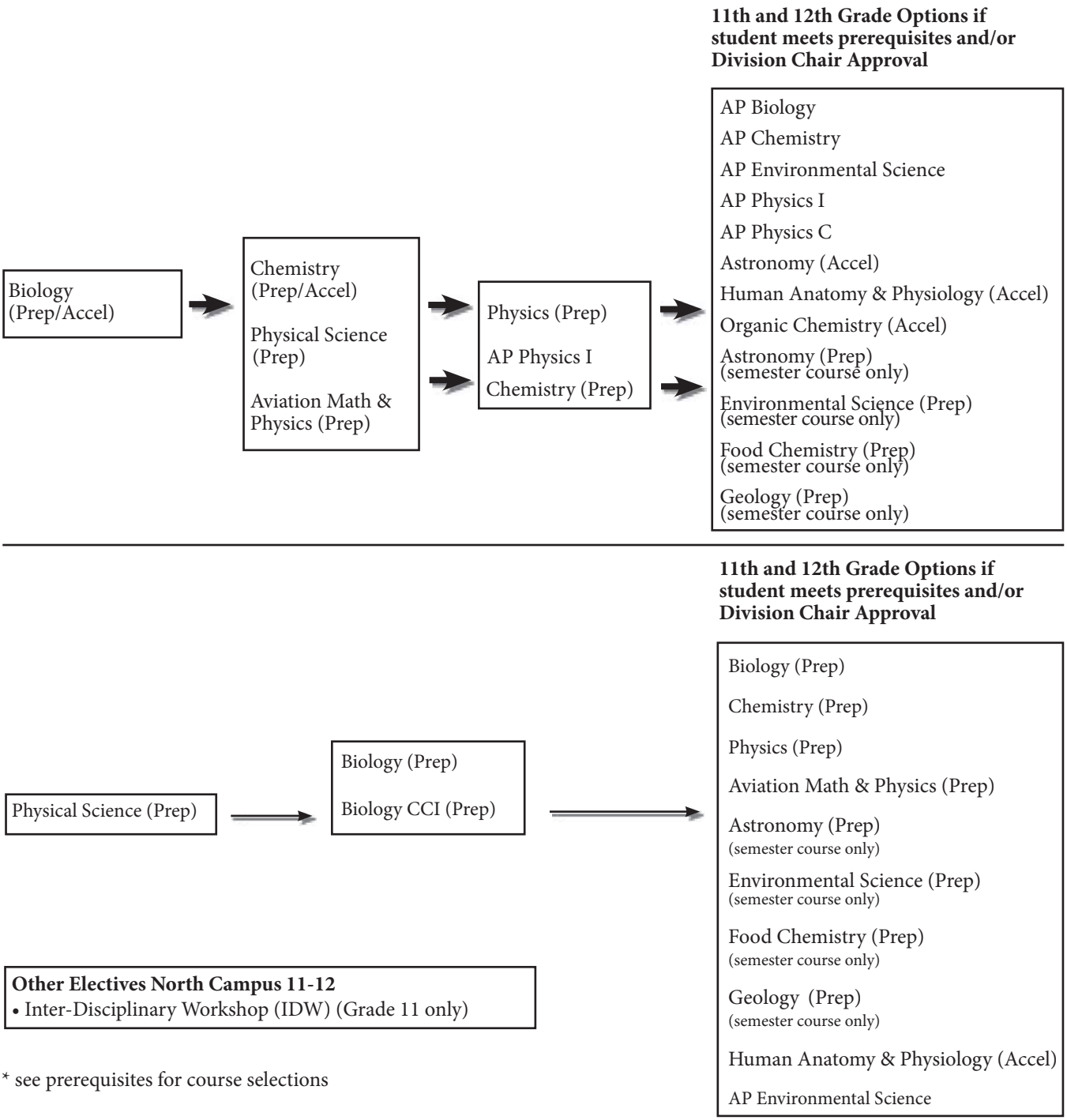
1. **AP Biology**
   AP Biology is the suggested course to prepare for the AP examination in biology or related examinations given by various colleges and universities. As the course description indicates, it is equivalent to two semesters of college biology.

2. **AP Chemistry**
   The AP Chemistry course is the equivalent of one or two semesters of college chemistry. AP Chemistry uses the College Board syllabus to prepare students for the AP examination in chemistry.

3. **AP Physics C**
   AP Physics C is a college level physics course for students whose post-high school plans call for a major in engineering science, the physical sciences, astronomy, medicine, or any related technical field. AP Physics C is a calculus-based university physics course and covers all of the material traditionally offered in the introductory college courses of engineering science and other related fields. As a result, the AP Physics C course students will be prepared for both AP Physics C examinations: Electricity and Magnetism, and Mechanics.

4. **AP Physics I**
   AP Physics I is an algebra-based physics course and covers mechanics, rotation and sound. This course is equivalent to one semester of college physics.

5. **AP Environmental Science**
   AP Environmental Science is the course to prepare students for the AP examination in environmental science. The course is equivalent to one semester of college environmental science.



* see prerequisites for course selections

Science Department Standards

As a result of their core science courses (biology, chemistry, physics) students will be able to know and apply...

1. the concepts, principles, and processes of scientific inquiry to investigate questions, conduct experiments, and solve problems.
2. concepts that explain how living things function, change, and adapt.
3. concepts that describe how living things interact with each other and with their environment.
4. concepts that describe properties of matter and energy and the interactions between them.
5. concepts that describe force and motion and the principles that explain them.
6. concepts that describe the features and processes of the Earth and its resources.
7. concepts that explain composition and structure of the universe and Earth's place in it.
8. the accepted practices of science.

- **Independent Study** Under specific conditions as outlined on p. 25 of the **Guide**, students may make application for Independent Study. In all cases, students must secure parent, teacher, counselor, divisional, and building administration approval. Independent Study may not be taken as an 8th semester/annual course.

Astronomy (Prep)

Credit: 1/2 Level: III
Grade Offered: 11, 12

Fall	SN5311
Spring	SN5312

Prerequisite: One year of science

Astronomy is the oldest of all sciences. It began as an attempt by people to understand the world around them. Even today, people wonder what lies beyond our planet. Astronomy is the laboratory study of the night sky, our solar system, and objects which make up the universe. The origin, evolution, and future of our solar system, galaxy, and universe will be studied, and the existence of black holes and other cosmic oddities will be discussed. Students will learn about the history and future of space exploration, and how the science of astronomy, however old, is always changing. Students cannot level change into Astronomy (Accel) from this class.

Astronomy (Accel)

Credit: 1 Level: IV
Grade Offered: 11, 12

Annual	SN7311
	SN7312

Prerequisite: One year of natural science & Physics (Chemistry strongly recommended)

Astronomy is the oldest of all sciences. It began as an attempt by people to understand the world around them. Even today, people wonder what lies beyond our planet. Astronomy is the laboratory study of the night sky, our solar system, and objects which make up the universe. The study of astronomy and space science requires knowledge of biology, chemistry, and physics. In this course, techniques used by amateur and professional astronomers will be incorporated, students will learn to identify objects in the night sky and make predictions of celestial events such as eclipses. The origin, evolution, and future of our solar system, galaxy, and universe will be studied, and the existence of black holes and other cosmic oddities will be discussed. Students will learn about the history and future of space exploration, and how the science of astronomy, however old, is always changing. Students cannot level change into Astronomy (Prep) from this class.

Aviation Mathematics & Physics (Prep)

Credit: 1 Level: III
Grade Offered: 10

Annual	SN4616
	SN4617

Prerequisite: Enrollment in Aviation Program or one year of Biology & C or better in Algebra (Prep)

Aviation Mathematics and Physics (Prep) explores the fundamentals of mathematics and physical sciences appropriate to the training of the aviation maintenance technician. The math topics include ratios and proportions, solving linear equations and geometric properties. The aviation physics topics include atmospheric properties, thermodynamics, fluid mechanics, heat, power, work, machines, and sound. Students will be offered the opportunity to take the course for science credit and/or college credit through Embry Riddle University as part of the Aviation Maintenance Program. Students taking the course for college credit must take the required tests for FAA certification for the Aviation Maintenance Program. Students taking the course for college credit will earn 2 hours of transcripted credit with Embry Riddle University.

Biology (Prep)

Credit: 1 Level: III

Grade Offered:	9, 10	Annual	SN5116
			SN5117
	11, 12	Annual	SN5111
			SN5112

Prerequisite: None

This college preparatory course focuses on an understanding of life and major life processes. Emphasis is placed upon unifying principles and concepts applicable to all life forms and the adaptations of diverse organisms to carry out fundamental functions. The objectives of the course are met through laboratory work, demonstration, lecture, homework, and visual aids. This preparatory course is planned for students who have attained basic

skills and who are working toward higher competencies. This course moves at a pace that allows frequent review and checks for understanding.

Biology Cross Curricular Integration (CCI) (Prep)

Credit: 1 Level: III
Grade Offered: 10 Annual SN5226
SN5227

Prerequisite: Recommendation from Humanities or by English or Math/Science chair approval

Biology CCI is one course of a two hour block that combines biology, language arts and reading. Students will study biology in a project-based setting with a focus on an understanding of life and major life processes. The objectives of this course are met through traditional science methods such as laboratory work, demonstration, lecture, homework and visual aids combined with the interpersonal communication skills, reading strategies and writing competencies of a language arts classroom. This course may only be taken in conjunction with English Cross Curricular Integration (CCI).

Biology (Accel)

Credit: 1 Level: IV
Grade Offered: 9, 10 Annual SN7116
SN7117

Prerequisite: None

This college preparatory course focuses on an understanding of life and major life processes. Emphasis is placed upon unifying principles and concepts applicable to all life forms, and the adaptations of diverse organisms to carry out fundamental functions. The objectives of the course are met through laboratory work, demonstration, lecture, homework, and visual aids. Biology (Accel) explores biological topics in greater depth than does Biology (Prep) and provides greater opportunity for involvement in AP course offerings at the junior/senior level. This course is planned for students with above average reading comprehension and writing skills.

AP Biology

Credit: 1 Level: V
Grade Offered: 11, 12 Annual SN8311
SN8312

Prerequisite: One year of Biology (Accel) with a B or better & one year of Chemistry (Physics strongly recommended)

AP Biology is a second course in biology offered to those students who have successfully completed the first level course. Taught at the college level, it is considered to be the equivalent of two semesters of college biology. The content is laboratory oriented. Areas covered in the course are plant growth and development, comparative vertebrate anatomy, animal physiology, genetics, microbiology, embryology, and a review of the basic principles of biology. Animals dissected for study in comparative vertebrate anatomy include the Amphioxus and one mammal (cat, rabbit, or mink). Human physiology is also an important part of the course. The program prepares students for the AP examination in Biology.

Chemistry (Prep)

Credit: 1 Level: III
Grade Offered: 10 Annual SN5616
SN5617
11, 12 Annual SN5611
SN5612

Prerequisite: Completion of Algebra Prep or higher

Chemistry is the study of composition and structure of matter and the changes that matter undergoes, and the energy associated with those changes. Principles of chemistry as well as applications of chemistry are emphasized. Chemical concepts are developed through the use of mathematical relationships and are reinforced through laboratory activities.

- **Independent Study** Under specific conditions as outlined on p. 25 of the **Guide**, students may make application for Independent Study. In all cases, students must secure parent, teacher, counselor, divisional, and building administration approval. Independent Study may not be taken as an 8th semester/annual course.

Chemistry (Accel)

Credit: 1 Level: IV
Grade Offered: 10 Annual SN7216
SN7217
11, 12 Annual SN7211
SN7212
Prerequisite: Completion of Algebra (Accel) with a grade of B or better or Algebra (Prep) with a B or better

Chemistry is the study of the composition and structure of matter, the changes matter undergoes, and the energy associated with those changes. Chemistry concepts are reinforced through laboratory activities. This course moves at a faster pace than Chemistry (Prep), while covering a greater range of topics to a greater depth. Mathematics is an integral part of the course. Out of class reading and comprehension are key to success in this course, and students will be expected to independently acquire information.

AP Chemistry

Credit: 1 Level: V
Grade Offered: 11, 12 Annual SN8211
SN8212
Prerequisite: One year of a natural science and one year of Chemistry (Accel) with a grade of B or better or Chemistry (Prep) with a grade of A (Physics strongly recommended)

AP Chemistry is intended to provide a college level course in chemistry for interested and capable students. Students considering careers in technical fields such as chemistry, chemical engineering, general engineering, and medicine, or for careers in areas where a knowledge of chemistry will be required, should consider this course. Those who complete the course may take the AP examination in Chemistry. This course is equivalent to two semesters of college chemistry. Topics include electronic and atomic structure, stoichiometry, reactions, thermochemistry, periodicity, bonding, intermolecular forces, kinetics, equilibrium, acids and bases, thermodynamics, and electrochemistry.

Environmental Science (Prep)

Credit: 1/2 Level: III
Grade Offered: 11, 12 Fall SN6011
Spring SN6012
Prerequisite: One year of science

General interest topics of ecology, population, politics, pollution, and other vital problems of survival of mankind are covered. The course provides the student with an awareness of our world and ways the student can help improve its quality. Students must participate in research in the form of discussion and reports. Field trips, lectures, and lab projects will supplement the research. Students cannot level change into AP Environmental Science from this class.

AP Environmental Science

Credit: 1 Level: V
Grade offered: 11, 12
Annual: SN8511
SN8512
Prerequisites: One year of a natural science and one year of a physical science (Chemistry or Physics) (Both Chemistry and Physics strongly recommended)

AP Environmental Science is an ecology course which allows students to apply many of the principles learned in biology, chemistry, and physics to better understand the biosphere and the environmental and economic choices facing contemporary society. Topics include: sustaining terrestrial and aquatic biodiversity; the history of the modern environmental movement; ecological principles; climate, weather, and biomes; the harvesting and use of renewable and non-renewable energy resources; petrochemicals, hazardous wastes, and toxicology; human population growth; soil and water resources; food and agriculture; mining and solid waste; the atmosphere and air pollution; climate change and ozone depletion; renewable resource sustainability and environmental ethics. Field trips are an integral part of this course and are therefore mandatory. Students cannot level change into Environmental Science (Prep) from this class.

Food Chemistry (Prep)

Credit: 1/2
Grade Offered: 11, 12
Level: III
Fall SN9211
Spring SN9212
Prerequisite: One year of science

This course utilizes the scientific method of study to investigate the chemical components and physical properties of various foods and how food reacts when different preparations and cooking methods are used. Dietary concepts are studied with emphasis on how nutrition, wellness, and the body's utilization of food are related. Students will learn various ways food is preserved, processed, and prepared. Homework and projects are a large part of this course. Students may receive either Practical Arts or Science credit.

Geology (Prep)

Credit: 1/2
Grade Offered: 11, 12
Level: III
Fall SN6121
Spring SN6122
Prerequisite: One year of science

This course is an introductory, hands-on look at the geologic study of our Earth and is designed for students interested in understanding more about our Earth. Students will learn about four general areas of study: (1) The Rocks and Minerals on our Earth (2) Topography of the Earth's surface (3) Dynamic Processes that shape our earth such as earthquakes, volcanoes, and mountain Building (4) Earth History, a study of the geologic time scale and how earth has changed over time.

Human Anatomy and Physiology (Accel)

Credit: 1
Grade Offered: 11, 12
Level: IV
Annual SN9511
SN9512
Prerequisite: One year of natural science and one year of Chemistry

Essential principles of human anatomy and physiology are presented including basic chemistry, cell and tissue studies, and an overview of body systems including skeletal, muscular, cardiovascular, respiratory, nervous, endocrine, reproductive, digestive, excretory, and immune. Dissection and computer technology will be an integral part of the course. Some comparative anatomy and physiology will be included especially while completing the dissections.

Introduction to Organic Chemistry (Accel)

Credit: 1
Grade Offered: 11, 12
Level: IV
Annual SN5811
SN5812
Prerequisite: One year of natural science and one year of Chemistry

This course is offered to give students who will take organic chemistry in college an advantage over the usual chemistry background. This includes those students who wish to go into one of the following fields: medicine, dentistry, pharmacology, nursing, home economics, biology, chemistry, and related fields. Students become familiar with the naming and structure of organic compounds. A knowledge of some of the basic reactions of organic chemistry is gained through laboratory work and study of lecture materials. Topics include alkanes, alkenes, alkynes, aromatics, alcohols, aldehydes, ketones, acids, amines, amides, and spectroscopy.

Physical Science (Prep)

Credit: 1
Grade offered: 9, 10
Level: III
Annual SN4516
SN4517
Prerequisite: None

Physical Science is a lab-based course which provides comprehensive practice and assessment of science skills. This course will cover chemistry, physics and earth science concepts while using the scientific method. Emphasis is placed on problem-solving, measuring, analyzing data and higher-order thinking skills such as inferring, questioning, designing experiments and drawing conclusions. Physical Science is a solid preparation for Biology, Chemistry, Physics and other advanced science courses.

Physics (Prep)

Credit: 1 Level: III
Grade Offered: 11, 12 Annual SN4911
SN4912
Prerequisite: Completion of Algebra (Prep) or higher

Physics is fundamental to all other sciences. The ideas and concepts are related to other sciences and mathematics. This course is laboratory centered. Laboratory activities are used to teach the main ideas. An activity is used to introduce an idea, then it is taught at the conceptual level, and finally an activity is used as an application of this idea. Topics include fundamental concepts of scientific thinking, motion, momentum, energy, gravity, rotational dynamics, waves, sound, light, electricity, magnetism, and quantum and nuclear physics.

AP Physics I

Credit: 1 Level: V
Grade Offered: 10 Annual SN8116
SN8117
11, 12 Annual SN8111
SN8112
Prerequisite: Completion of Advanced Algebra w/ Trigonometry (Prep) or Geometry (Accel)

AP Physics I is an algebra-based college level physics course. This is a laboratory study for student discovery of the physical universe. Major topics of study include: motion, energy, dynamics, momentum, light and sound. This is a first year physics course and is equivalent to one semester of college level physics. Students can take AP Physics C as a second year course.

AP Physics C

Credit: 1 Level: V
Grade Offered: 11, 12 Annual SN8411
SN8412
Prerequisite: One year of natural science and Physics (Accel) with a grade of B or better or Physics (Prep) with a grade of A and completion or concurrent enrollment in Calculus AB or BC (Chemistry strongly recommended)

AP Physics C is a calculus-based college level physics course. This course would be ideal for those planning a career in engineering, medicine, science, math, health-related fields, or any technical field. Major topics studied are mechanics, electricity, and magnetism. Supplemental topics may include thermodynamics, physical and geometric optics, and modern physics. Understanding of basic principles and application of these principles in problem solving are the major goals of this course. Those who take the course may take the AP examination in Physics. This course is equivalent to two semesters of college physics. As a result of this course, students will be prepared for both AP Physics C examinations: Electricity and Magnetism, and Mechanics.

Career Internship Program

Credit: 1/2 (dc) Level: IV
Grade Offered: 11, 12 Fall SN5551
Spring SN5552
Summer SN5558, SN5559

This course is designed for the career-minded student who is seeking work experience in an area that the student wishes to pursue upon graduation or after attending college. The student will apply for the internship through the department that they wish to receive credit. The student will work a minimum of 90 hours during the semester for credit for the course. The student will have weekly contact with the supervising teacher, develop a culminating project based upon the experience, be evaluated by the supervising teacher and the employer for the final grade. The student is responsible for their own transportation to and from the work place.
This course may be taken for duplicate credit. It is the sole discretion of each department team to recommend the student for a work internship. Application does not guarantee admission.

Science Classes

When choosing Annual Courses, you will need the first and second semester codes.

Freshman Courses

SN5116/7	Biology Prep
SN7116/7	Biology Accel
SN4516/7	Physical Science Prep

Sophomore Courses

Annual

SN4616/7	Aviation Math & Physics Prep
SN5116/7	Biology Prep
SN5226/7	Biology CCI Prep
SN7116/7	Biology Accel
SN5616/7	Chemistry Prep
SN7216/7	Chemistry Accel
SN4516/7	Physical Science Prep
SN8116/7	AP Physics I

Junior and Senior Courses

Annual

SN7311/2	Astronomy Accel
SN5111/2	Biology Prep
SN8311/2	AP Biology
SN5611/2	Chemistry Prep
SN7211/2	Chemistry Accel
SN8211/2	AP Chemistry
SN8511/2	AP Environmental Science
SN9511/2	Human Anatomy & Physiology Accel
SN5811/2	Introduction to Organic Chemistry Accel
SN4911/2	Physics Prep
SN8111/2	AP Physics I
SN8411/2	AP Physics C

Fall Only

SN5311	Astronomy Prep
SN6011	Environmental Science Prep
SN9211	Food Chemistry Prep
SN6121	Geology Prep

Spring Only

SN5312	Astronomy Prep
SN6012	Environmental Science Prep
SN9212	Food Chemistry Prep
SN6122	Geology Prep

Did You Know?

20 High-Paying Science Careers for the Next Decade

- Surgeon
- Anesthesiologist
- Internist
- Dentist
- Oral Surgeon
- Nurses
- X-ray technician
- Physician Assistant
- Psychiatrist
- Environmental Consulting
- Natural Sciences Manager
- Mining
- Petroleum
- Green Energy
- Civil Engineer
- Aerospace Engineering
- Astronomy
- Engineering Manager
- Nanotechnology
- Materials Science

A recent U.S. Department of Commerce study shows that over the past 10 years, growth in Science, Technology, Engineering and Mathematics (STEM) jobs was three times greater than that of non-STEM jobs. The report also shows that STEM jobs are expected to continue to grow at a faster rate than other jobs in the coming decade.

Have you ever considered a career as a...

Acoustical Research Engineer
Aeronautical Engineer
Agricultural Engineer
Anneal Physiology
Archeologist
Assembling Engineer
Astrogeologist
Astronaut
Astronomer
Astrophysicist
Audio Engineer
Bioanalyst
Biochemist
Botanist
Cardiologist
Chemical Engineer
Chemist
Computer Scientist
Cytogeneticist
Dentist
Education
Engineer
Entomologist
Food Science
Food Science Technician
Forensic Anthropologist
Forensic Chemist
Forensic Scientist
Forestry
Geologist
Geoscientist
Health Care Worker
Herpetologist
Horticulturist
Life Science Writer
Marine Biologist
Molecular Biologist
Neurobiologist
Oceanographer
Physical Trainer
Physicist
Plant Ecologist
Plant Geneticist
Plastic Surgeon
Psychologist
Quality Insurance Engineer
Researcher
Solid State Chemist
Space Scientist
Staff Scientists
Structural Engineer
Surgeon
Systems Engineer
Veterinarian
Water Resources Engineer
Wildlife Biologist
Wildlife Ecologist
Wildlife Psychologist
Zoo Keeper
Zoologist